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MONTHLY LETTER OF THE BUREAU OF ENTOMOLOGY  
UNITED STATES DEPARTMENT OF AGRICULTURE

Number 161

September, 1927

MR. BISHOPP PLACED IN CHARGE OF INVESTIGATIONS

OF INSECTS AFFECTING MAN AND ANIMALS

To meet the need of correlating and coordinating the experimental work on insects affecting man and animals, Mr. F. C. Bishopp has been transferred from Dallas, Tex., to Washington, and placed in immediate charge of this phase of the Bureau's work.

The work on insects affecting animals and poultry has for a number of years been conducted under the able direction of Mr. Bishopp, but the importance of this work and the large interests involved make it especially desirable that it be directed from Washington. The closely related work on habits and development of insects which directly affect man logically falls within the same unit.

In establishing the unit, "Insects Affecting Man and Animals," it is definitely recognized that many phases of the problems must be handled in close cooperation with the Federal Public Health Service, the Bureau of Animal Industry, and other agencies. Mr. Bishopp's familiarity with the wide variety of problems which come within these fields makes him well fitted to direct these important activities.

The work on insects injurious to cotton will continue under the direction of B. R. Coad, with headquarters at Tallulah, La. Mr. Bishopp will act as the Washington representative of Mr. Coad.

L. O. H.

## INSECTS AFFECTING MAN AND ANIMALS

F. C. Bishop, Senior Entomologist, in Charge

H. N. Brundrett, Professor of Horticulture at John Tarleton College, Stephenville, Tex., who was a temporary appointee at the Dallas, Tex., Laboratory during the recent summer, resumed his collegiate duties on September 12.

On September 17, at the termination of his six months' period of service, R. J. Roberts left the Dallas, Tex., laboratory to take up graduate studies at Iowa State College, where he has a fellowship in Entomology.

O. G. Babcock reports the resignation of Dr. J. H. Black, veterinarian of the Texas Experiment Station No. 14. Doctor Black has been working with Mr. Babcock on the cooperative projects of the Bureau of Entomology and the Texas Experiment Station relating to external parasites of sheep and goats.

In addition to his duties at Seneca, Tex., O. G. Babcock will continue the periodic observations on the area experiments in flytrapping screw worms in Menard County. This work was carried on by R. A. Roberts during the recent summer, and is being conducted in cooperation with County Agent Wisbit and a number of ranchmen.

In connection with a trip through the South, H. V. Peffers, investigator for the Bureau of the Budget, spent some time becoming familiar with Dr. W. V. Wingle's studies on the control of malaria mosquitoes and the investigation conducted on insects affecting livestock.

H. W. Ladd has been placed in charge of the Dallas laboratory.

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## COTTON-INSECT INVESTIGATIONS

B. R. Goad, Entomologist, in Charge

J. L. Webb has been transferred to the field laboratory at Spiro, Okla., where, in connection with Dr. W. B. McIndoo, he will conduct investigations on insect pests.

The temporary appointments of G. M. Stone and Wm. A. Brunson, field assistants at the Florence, S. C., laboratory, were terminated September 30.

R. L. Callahan, D. M. Ratcliff, G. L. Hales, and L. J. Padgett, field assistants at the Tallulah, La., laboratory, have resigned to return to college.

## TRUCK-CROP INSECT INVESTIGATIONS

J. E. Graf, Senior Entomologist, in Charge

J. E. Dudley, Jr., and E. M. Searls, of the Madison, Wis., laboratory, left Madison September 10 on a field inspection trip. On September 11 they visited Urbana, Ill., and conferred with Drs. Metcalf, Balduf, and Milam, of the Illinois Experiment Station, and with Dr. Drake, of the Ohio Experiment Station. At La Fayette, Ind., they conferred with J. J. Davis, and visited the Cereal and Forage Laboratory, now in charge of C. M. Packard. The Mexican bean beetle laboratory at Columbus, Ohio, was next visited, where conferences were held with N. F. Howard and others. On September 15 they visited the corn-borer station at Toledo, Ohio, later visiting Monroe, Ann Arbor, and East Lansing, Mich., where discussions were held with Bureau and State workers. They returned to Madison on September 17.

On September 21 C. H. Popenoe, of the Sligo, Md., laboratory, visited Pomeroy, Pa., and other points in the mushroom-growing region near Philadelphia, to obtain data with relation to the fumigation of mushrooms with hydrocyanic-acid gas, and to consult with growers about their difficulties with insect pests during the past season.

On September 20 K. L. Cockerham left Biloxi, Miss., for a scouting tour of the islands in the Mississippi Sound to determine whether morning-glory plants occurring there were infested with the sweet-potato weevil. The points visited included Cat Island, Isle of Pitre, Creole Gap, Johnson Bayou, Three Mile Bay, and Shell Point. Morning glories infested with the weevil were found only on the Isle of Pitre.

S. E. Crumb and F. S. Chamberlin, who have been conducting experiments in vacuum fumigation as a measure for the control of the cigarette beetle at Tampa, Fla., returned to their official stations at Clarksville, Tenn., and Quincy, Fla., in the latter part of September.

J. U. Gilmore and K. B. McKinney, of the Tobacco Insects Laboratory at Clarksville, Tenn., have been temporarily transferred to the Mexican fruit-worm inspection service at Harlingen, Tex., where they are working under the direction of Dr. A. C. Baker.

Early in September Walter Carter, of the Twin Falls, Idaho, sugar-beet insects laboratory, visited Berkeley and other points in California, where he discussed the sugar-beet leafhopper situation with entomologists of the University of California.

E. G. Smyth, a former employee and collaborator of this office, visited Washington on September 10, en route from California to New York.

The temporary appointments of the following employees have been terminated during the month of September: I. R. Taylor, Philadelphia, Pa.; A. L. Goodrich, Twin Falls, Idaho; V. E. Williams, Alhambra, Calif.; M. W. Stone, Walla Walla, Wash.; T. E. Bronson, Madison, Wis.; H. I. West, Foley, Ala.; H. L. Weatherby and D. H. DeLong, Columbus, Ohio; S. C. Lyon and W. F. Darrow, Clarksville, Tenn.; and J. E. Durham, Estancia, N. M.

CEREAL AND FORAGE INSECT INVESTIGATIONS

W. H. Larimer, Senior Entomologist, in Charge

Dr. S. P. Minkiewicz, of the Government Institute for Agricultural Research, Pulawy, Poland, recently spent a week with Geo. I. Reeves, in charge of the Salt Lake City laboratory, and also spent some time with W. B. Cartwright at the Sacramento, Calif., laboratory.

Dr. E. M. Transeau, of the Ohio State University, made a brief visit early in September to the Washington office, while en route from Europe to his home. He has recently made a survey of various parts of Europe, studying plant associations in connection with the degree of infestation of corn by Pyrausta nubilalis.

A summer shipment of 30,200 Pyrausta nubilalis chrysalids, parasitized by Phaeogenes planifrons, and 7,500 cocoons of Dioces punctaria, was made on August 5 from Seneca, Italy, by the European Parasite Laboratory at Hyeres, Var, France. These parasites were collected by Dr. H. E. Parker at Bergamo, in Lombardy.

Netal shipments of Pyrausta pansae from Europe to this country for the last fiscal year were Filumena crassifemur, 47,340; Dioces punctaria, 11,203; Masicera senilis, 1,653; Microgaster tibialis, 166,722; and Phaeogenes planifrons, 17,017. At the Arlington, Mass., laboratory there were reared 43,701 Zenillia roseanae; 11,447 Macrocentrus abdominalis; 87 Dioces punctaria; 33,175 Amantoles sp.; and 6,684 Masicera senilis. These two lists make the total parasites sent for use in the warfare against the corn borer 348,037. To collect the imported parasites 150 laborers were employed for two weeks in the summer collecting period, extending from July 25 to August 10, 1926, in northern Italy, and 146 during the months of November and December, 1926, and January and February, 1927.

Dr. T. A. Thompson, in charge of the European Parasite Laboratory, and Prof. R. H. Chapman, of the University of Minnesota, who, under a Guggenheim fellowship, has passed the winter there working on biotic potential, read papers at the International Ecological Congress, held at Budapest September 4 to 9.

W. Gamkrelidze, a graduate of the University of Paris, has recently been appointed Specialist in Hymenoptera and assigned to the staff of the European Parasite Laboratory.

Recent visitors at the Hyeres Laboratory have included Dr. L. O. Howard, Washington, Prof. E. M. Transeau, Ohio State University, Prof. Metalnikov, Pasteur Institute, Paris, Dean C. F. Curtiss, of the Iowa State College of Agriculture, and G. L. Christie, Director of the Indiana Experiment Station.

V. L. Wildermuth, of the Tempe, Ariz., laboratory, recently made a ten days' survey of southern California and southwestern Arizona in connection with work on the alfalfa caterpillar, the clover-seed chalcis fly, and the southwestern corn borer.

TROPICAL AND SUBTROPICAL PLANT INSECT INVESTIGATIONS

A. C. Baker, Senior Entomologist, in Charge

C. F. Doucette, of the bulb-insects sublaboratory at Puyallup, Wash., visited Washington September 6 and 7 to confer with bureau officials on the work of the sublaboratory. He was then en route to France, to attend the convention of the American Legion at Paris. Before returning to the United States he will visit the bulb-growing sections of Holland and England.

Dr. C. A. Teigel recently returned from a visit to Central Park, L. I., where, in cooperation with several large commercial bulb-growing concerns, he is conducting tests of the hot-water treatment of narcissus bulbs, in continuation of the sterilization experiments inaugurated in the bulb region of Long Island in August. The tests are conducted to determine the effect of this treatment on field-grown bulbs, when done at different times and under varied conditions. Particular attention is being paid to the effect of the treatment on the flowering qualities of the bulbs treated, and the subsequent increase in production.

During the present season E. A. McGregor, of the citrus thrips project, Lindsay, Calif., has cooperated with Dr. H. S. Fawcett, pathologist, of the University of California, in tests with dusts and sprays for the possible control of "June drop" of navel oranges. Most of the materials used were of a fungicidal nature, it having been thought that the shedding phenomenon might be caused partly by a fungous organism. The most interesting result to date is that certain of these applications have been fairly effective against the citrus thrips.

On September 1 the New Orleans laboratory was moved into its new quarters at Gentilly Road and St. Anthony Street. The building is leased from the Parking Commission of New Orleans, and has been planned especially to meet the requirements of the work of this station, as described in the August News Letter.

Visitors to the new laboratory in September included James Zetek, Ancon, Canal Zone, Dr. H. L. Dozier, Newark, Del., and T. F. Catchings, Shreveport, La.

Horace H. Bliss, who was temporarily engaged as field assistant, has returned to the University of New Hampshire, where he is instructor in chemistry.

O. C. McBride, of the Orlando, Fla., laboratory, arrived in New Orleans on September 6. He will spend several months there analyzing data obtained at Orlando during the last several years.

H. F. Willard and Arthur C. Mason, of the Honolulu station, report that records of infestation of fruits by the Mediterranean fruit fly, Ceratitis capitata, indicate that the fly was less abundant about Honolulu during 1927 than during any of the previous eight years.

## STORED-PRODUCT INSECT INVESTIGATIONS

E. A. Back, Senior Entomologist, in Charge

In July Perez Simmons was placed in field charge of the Bureau's investigation of dried-fruit insects. D. K. Grady, Secretary of the California Dried Fruit Association, writes, under date of September 13, in part as follows:

"I have just returned from Fresno, and it seems to me that the Fresno office is making fine progress toward a solution. The help that Dr. B. L. Howard has been able to render to Simmons and Reed has also proven a very valuable factor.

"From the standpoint of the grower and packer, conditions at the present time are very discouraging. It appears that probably less than 50 per cent of the white figs grown in the San Joaquin Valley will be suitable for packing and shipment. This means that the growers are encountering a tremendous amount of grief, and I am told that some of the packers are refusing to accept six out of every seven deliveries brought to the doors of the packing houses. . . . We wish we knew of some way of salvaging figs which are partially spoiled by the various kinds of adulterations described by the Food, Drug, and Insecticide Administration. Messrs. Simmons and Reed are putting in very long hours and are being "run ragged" in their efforts to develop suitable control methods and to find out all that is possible about conditions and their causes."

Two papers by Drs. B. C. Roark and T. F. Cotton, entitled "The Insecticidal Action of Some  $\beta$ -Esters of Halogenated Fatty Acids in the Vapor Phase," and "Fumigation of Stored-Product Insects with Alkyl Formates," were read at the meeting of the American Chemical Society held in Detroit early in September. Although these papers were temporarily withdrawn, to be published after further work has been done, press notices have aroused inquiries from all parts of the country.

In September, at the request of the Celanese Corporation of America, experiments were conducted to determine whether the mixture of artificial silk fibers with woolen fibers had a tendency to slow down insect attack.

J. C. Hamlin, formerly in charge of the field station at Fresno, has been assigned to an investigation of methods of marketing stored food-products in such a way as to exclude insects. Mr. Hamlin will establish a laboratory at Tampa, Fla.

Among the interesting features of the Eleventh Exposition of the Chemical Industries, held September 25 to October 1, at the Grand Central Palace, New York, was a display of the new fumigant consisting of a mixture of ethylene dichloride and carbon tetrachloride, accompanied by enlarged photographs of clothes moths and their ravages. This fumigant was first described by T. F. Cotton and B. C. Roark in the August, 1927, number of the *Journal of Economic Entomology*.

On September 12 A. T. O. Larson and D. M. Fisher, of the bean weevil investigations, established a temporary laboratory in the office of the Horticultural Commissioner at Modesto, Calif. This action facilitates studies being made of the relationship existing between farm-storage conditions and infestations of new-crop beans received at warehouses. Seventeen bean warehouses in Stanislaus, San Joaquin, and Merced Counties are cooperating with the Bureau by furnishing samples of all lots of beans received, together with notes as to the farms where they were grown. Mr. Larson writes: "We are getting wonderful cooperation from the warehousemen and farmers. We are furnishing the Horticultural Commissioner a list of all weevilly samples. He then sends a notice to the owner and to the warehouseman where the beans are stored, requiring that the lots be fumigated within five days. The beans are tagged, and are not allowed to be moved until they are fumigated. By visiting each farm as soon as a record of infestation is established, valuable information is obtained. One bean grower who neglected storage conditions during the past growing season harvested a crop on which he took a loss of \$8,000 because of bean weevils. This and other similar losses are not the result of entomological guesswork. They are the cold facts, set forth in warehouse transactions."

#### BEE CULTURE INVESTIGATIONS

James I. Hambleton, Apiculturist, in Charge

The Maryland State Beekeepers' Association held a field meeting at the Bee Culture Laboratory on October 1. E. L. Sechrist gave a talk based on his recent experience as judge of the honey and bee exhibit at the Ohio State Fair. He placed special emphasis on the fact that at the present time, at State and other fairs, the honey and bee exhibits are not characterized by sufficient explanation, oral and otherwise, to make them of educational value to those not already familiar with bees and their products. He strongly urged making such explanations an indispensable part of every apicultural exhibit, both for their educational value and because of the resulting greater demand for the products of the apiary. Much interest on the part of those present was displayed in this topic, and also in a round-table discussion of the new honey-grading rules.

Miss Mary Louise Crossman has resigned her temporary appointment as Field Assistant, to take up graduate work at the University of Michigan.

Dr. S. O. West, of Johns Hopkins University, was a recent visitor at the laboratory.

FOREST INSECT INVESTIGATIONS

F. C. Craighead, Senior Entomologist, in Charge

On September 9 R. A. St. George left Asheville, N. C., for the Eastern Field Station, East Falls Church, Va. On his way across the State of North Carolina many dying hickory and oak trees were noted that appeared to be in the same condition as the same kinds of trees in Asheville and vicinity. This was particularly the case at High Point and Greensboro. At High Point two large estates were visited on which there were about 50 dead hickory trees and 25 dead oak trees. The hickory trees were heavily infested by broods of the hickory barkbeetle (Eccoptogaster quadrispinosus Say), which were mainly in the larval stages. A few eggs were also found. Judging from the similarity of these conditions to conditions near Asheville, where a thorough study of the situation had been made, it would appear that the trees were weakened from the effects of the drought of 1925 and in the fall of that year were attacked for the first time; and the insects have been breeding up in numbers since then. The pests have increased to such an extent that they are now a real menace to the community. Control measures were recommended, and are being carried out as rapidly as possible, to eliminate the danger of further destruction. The oak trees, mainly red and black, with some white oaks, were found to be suffering from a combination of causes, principally drought and old age, combined with a heavy attack of *Agrilus* all along the stem. A similar condition of the oaks was noted some 10 or 12 years ago throughout the South. Many of them died following a period of drought; they were also infested by the same insect. At Greensboro, the Guilford Courthouse National Military Park, it was estimated that some 80 hickory trees were infested by the hickory barkbeetle. Several oaks were noted to be dying here also.

Dr. T. E. Snyder left Washington on September 16 to investigate termite damage to the woodwork of buildings, and to aid in suggesting provisions for inclusion in city building codes to prevent such injury, particularly on the Pacific Coast and in the Southwestern, Gulf, and central Western States, where termites are especially injurious. The State Department of Agriculture of California is cooperating in this project. On October 18 to 21, inclusive, there will be a meeting of the Pacific Coast Building Officials Conference, at Phoenix, Ariz., where State officials represent the territory from Seattle, Wash., to San Diego, Calif., and eastward to Arizona. After attending this conference Dr. Snyder will proceed to Honolulu, Hawaii, on a similar mission, at the invitation of the Hawaiian Board of Commissioners of Agriculture and Forestry.

J. C. Evenden reports the continued spread of the infestation by the mountain pine beetle in the Beaverhead National Forest. Undoubtedly the beetles dispersed from the infestation on the west side of the Continental Divide, in the Bitterroot National Forest, thus making a flight of 5 or 10 miles.

J. M. Miller reports that an infestation of the Jeffreys pine beetle of several years' standing on the Inyo National Forest has declined this year. A few years ago a large windfall occurred in this region, several million feet of timber being blown down. This infestation developed in the blow-downs, and attacked green timber, but soon lost its momentum after the dying timber from the windfalls was no longer available.

Surveys of the California-Oregon control project area, conducted by F. P. Keen during the recent summer, show the heaviest losses of the last 10 years. In 1927 more than 350,000,000 feet of timber was killed. Private owners in this region are very much disturbed, and it is probable that a great deal of control work will be carried on during the coming winter and spring.

H. J. MacAlonney reported for duty August 25, after a three months' furlough. During this period he was working in Canada under Dr. J. M. Swaine, of the Dominion Entomological Branch, on the white-pine weevil, the problem to which he is assigned in the New England States. This service was part of a cooperative arrangement between the Dominion Entomological Branch and this Bureau to undertake jointly the investigation of this serious pest of white pine.

Dr. M. W. Blackman returned September 1 to the New York State College of Forestry, at Syracuse University. He had been with the Bureau as Specialist in Scolytidae for the preceding 15 months, engaged in biological studies of the Black Hills beetle on the Kaibab and Colorado National Forests.

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#### DECIDUOUS-FRUIT INSECT INVESTIGATIONS

A. B. Quaintance, Associate Chief of Bureau, in Charge

G. F. Mozenette, in charge of the Bureau's pecan insect laboratory at Albany, Ga., attended the twenty-sixth Annual Convention of the National Pecan Growers' Association, held at Shreveport, La., September 27, 28, and 29, and delivered an address on "Factors which enter into the Successful Control of the Pecan Nut-Case Borer."

Oliver I. Sharp, in charge of peach-insect investigations, writes that Demetrio E. de Torres, of Madrid, Spain, who for a year has been studying entomology in this country, spent four days in August at the peach-insect laboratory at Fort Valley, Ga., to observe experiments under way and to acquaint himself with methods employed in controlling peach insects.

Harold Compere, an entomologist at the Citrus Experiment Station of the University of California, Riverside, Calif., visited the Honolulu station of the Bureau on August 5. Mr. Compere was on his way for an extended stay in Australia in search of beneficial insects.

## TAXONOMIC INVESTIGATIONS

S. A. Rohwer, Senior Entomologist, in Charge

R. A. Cushman has completed preparations for a journey to the Philippine Islands, and will start for Los Banos early in October. The object of this trip is to pack and ship to this country the very large collection of insects bequeathed to the U. S. National Museum by the late O. F. Baker, who was Dean of the Philippine College of Agriculture. This collection is reported to include more than 1,450 Schmitt boxes of pinned specimens, a large quantity of unmounted material, and a very extended card index of references to Indo-Malayan entomology. It contains many types and hundreds of species new to the National collection. No one in the Islands could undertake the task of packing this collection, and because of its importance and to comply with the expressed wish of Dean Baker the Bureau is cooperating with the Museum in arranging for its safe transport to Washington. In order that Mr. Cushman may properly represent the Museum he has been appointed Honorary Assistant Custodian of Diptera. It is expected that he will be away from Washington until early in January.

A. B. Gahan left Washin ton September 12, and sailed from New York the following day, for an extended trip to Europe. He will there study types of parasitic Hymenoptera, and will consult with other specialists on these insects. He intends to make his first stop at the British Museum.

Prof. L. B. Mitchell, of the department of zoology and entomology, North Carolina State College of Agriculture, spent September 16 in the U. S. National Museum, comparing material with the collection of bees of the genus Megachile. Professor Mitchell was on his way home from the Bussey Institution, where he studied during the summer months.

Dr. J. M. Aldrich, of the U. S. National Museum, returned September 3 from a three months' collecting trip. He traveled by automobile from Washington to San Francisco, then north to Portland and Spokane, returning by the Yellowstone National Park. Collecting was done principally in the Rocky Mountains, the Sierras, at Wells, Nev., and in the Yellowstone Park. Of the sources named the Yellowstone Park furnished the largest number of insects.

Dr. F. A. Chapin spent September 16 to 26 collecting insects at Cape Henry, Va., paying especial attention to the fauna of the bald cypress (Liquidambar distichum Binn.). Among his collections were additional material of the rare cypress skink and an undescribed species of Inscutifcris.

Dr. Adna R. Durying has just completed a paper on the larva of the economically important genera Diacrotica and Phyllobrotica. At the end of the paper there is a discussion of the subfamilies Galerucinae and Goliathinae.

## JAPANESE BEETLE INVESTIGATIONS

Loren B. Smith, Senior Entomologist, in Charge

Owing to the fact that the activities of the adult Japanese beetle have ceased for the present season, it was possible on October 1 to lift the quarantine regulations covering farm products. No beetles have been found in any farm products inspected in the last week of September. Owing to the unusually cool nights, the few beetles remaining at a number of points within the infested area have shown a tendency to crawl down into flower blossoms for protection, dahlias being favored in this regard. Since a considerable quantity of cut flowers are still being shipped from the regulated area to outside points, it has been considered impracticable to permit the unrestricted movement of these articles. As a result, the quarantine restrictions requiring inspection and certification of cut flowers are being kept in effect until October 15, the maximum limit of the quarantine on farm products and cut flowers. The lifting of the farm-products quarantine reduces the usual period of the restrictions on these articles by 16 days and permits a considerable reduction in personnel, with consequent saving in the cost of administration.

By invitation, Loren B. Smith, in company with Victor I. Safro of the New Jersey Department of Agriculture, attended the annual meeting of the Federation of Shade Tree Commissions, held at East Orange, N. J., on September 28. Mr. Smith gave a very well received talk on the Japanese beetle, which was followed by an interesting discussion. Mr. Safro offered the cooperation of the combined forces of the Japanese Beetle Laboratory and the New Jersey Department of Agriculture.

David Hall, of the Department of Entomology of the University of Arkansas, was a recent visitor at the Riverter laboratory.

Three large shipments of parasite material were received at the laboratory in September. One of these, a consignment of *Tiphia* from India, was taken from the boat at Boston and rushed to Riverter by messenger, thus saving considerable time which otherwise would have been consumed between these two points.

LIBRARY

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NEW BOOKS

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Insects of Samoa and other Samoan terrestrial Arthropoda. Pt. 2, fasc. 1; pt. 3, fasc. 1-2; pt. 7, fasc. 1; maps No. 1-2. London, printed by order of the trustees of the British Museum, 1927. Contents: Pt. 2, fasc. 1, Hymenoptera, Fulgoridae, F. Muir; Psyllidae (Chenidae), D. B. Crawford; Coccoidea, Aphididae, and Aleyrodidae, F. Laing, 45 p.; pt. 3, Lepidoptera; fasc. 1, Butterflies of Samoa and some neighboring island-groups, G. H. E. Hopkins, p. 1-64; fasc. 2, Micro-lepidoptera, Edward Meyrick, p. 65-116, illus.; pt. 7, Other orders of insects; fasc. 1, Isoptera; Family Termitidae, Gerald P. Hill, p. 1-44; maps: No. 1, Southwest Pacific; No. 2, Carribean Islands.

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Neue Versuch über die Bedeutung von Raftorgan und Pollenduft für die Verständigung im Bienvolk. Zeits. f. wissenschaftliche Biologie, Abt. C (Zeits. f. vergleichende Physiologie), Bd. 4, Heft 1, p. 1-31, illus., April 23, 1926. Zitierte Literatur, p. 21.

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Hase, Albrecht.

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Moore, Susan P.

Treating poisonous spider bites with antitoxin. Experiments at São Paulo, Brazil, by progressive inoculation of sheep, have developed a highly active anti-serum for the venom of two species. The Nation's Health, v. 9, No. 7, p. 45-47, illus., July, 1927. On Latrodectus mactans.

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